

Amendments to the Claims

Listing of Claims:

Claim 1 (canceled).

Claim 2 (previously presented). The method according to claim 37, which comprises:

using, as the system for testing the integrated circuit, an automatic test equipment (ATE); and

applying the set of test patterns to the integrated circuit via the automatic test equipment.

Claim 3 (original). The method according to claim 2, which comprises implementing the neural network in the automatic test equipment.

Claim 4 (previously presented). The method according to claim 37, which comprises generating the set of test patterns on a random basis.

Claim 5 (previously presented). The method according to claim 37, wherein step (d) includes adapting inter-unit weights of the neural network through back-propagation.

Claim 6 (previously presented). The method according to claim 37, which comprises repeating steps (a) to (d) until a level of adaptation in step (d) falls below a given

value.

Claim 7 (original). The method according to claim 5, which comprises storing data representing predetermined neural network parameters after terminating a repetition of steps (a) to (d).

Claim 8-22 (canceled).

Claim 23 (previously presented). The method according to claim 37, which comprising repeating steps (B) to (E) until the given test criteria are met.

Claim 24 (previously presented). The method according to claim 37, which comprises repeating steps (B) to (E) until a condition is met, the condition being selected from the group consisting of meeting the given test criteria and repeating steps (B) to (E) a given number of times.

Claim 25 (previously presented). The method according to claim 37, which comprises concluding that the given test criteria are met if the set of test patterns is associated with an average fitness above a given value.

Claim 26 (previously presented). The method according to claim 37, wherein step (E) includes combining at least some of the test patterns according to the genetic algorithm in order to provide the new set of test patterns.

Claim 27 (original). The method according to claim 26, which further comprises:

selecting test patterns from the set of test patterns according to given selection criteria in order to provide selected test patterns; and

combining the selected test patterns according to the genetic algorithm to provide the new set of test patterns.

Claim 28 (original). The method according to claim 27, which comprises selecting a test pattern if the test pattern is associated with a fitness value greater than a reference value.

Claim 29 (original). The method according to claim 27, which comprises selecting a test pattern if the test pattern is associated with a highest fitness value of all unselected test patterns.

Claim 30 (original). The method according to claim 27, which comprises selecting a test pattern if the test pattern is associated with a highest fitness value of all unselected test patterns, and repeating the selecting step until a given percentage of test patterns has been selected.

Claim 31 (original). The method according to claim 29, wherein step (E) includes:

(F) sorting selected test patterns according to an order of associated fitness values;

(G) randomly selecting parent test patterns from test patterns as sorted in step (F);

and

(H) combining selected ones of the parent test patterns.

Claim 32 (previously presented). The method according to claim 37, which comprises using at least one element selected from the group consisting of a mutation, a crossing over, and a re-combination for the genetic algorithm.

Claim 33 (previously presented). The method according to claim 37, wherein the step (A) includes providing a plurality of sets of test patterns such that each of the sets of test patterns is included in a test pattern population.

Claim 34 (previously presented). The method according to claim 37, which comprises providing a plurality of test pattern populations and performing steps (B) to (E) for each of the test pattern populations.

Claim 35-36 (canceled).

Claim 37 (currently amended). A method of testing an integrated circuit, the method which comprises:

adapting a neural network to approximate a behavior of the integrated circuit, by:

(a) applying a set of test patterns to the integrated circuit;

(b) applying the set of test patterns to the neural network;

(c) comparing outputs of the integrated circuit and outputs of the neural network to form a comparison result; and

(d) adapting parameters of the neural network to approximate the behavior of the integrated circuit on a basis of the comparison result;

subsequently applying further test patterns to the neural network thus adapted;

processing an output of the neural network to determine whether predetermined criteria are met;

selecting those further test patterns that meet the predetermined criteria;

(A) providing a set of test patterns consisting of the selected test patterns;

(B) applying the set of selected test patterns to the integrated circuit using an automatic test equipment (ATE) as a measurement system for semiconductors;

(C) determining the outputs of the integrated circuit;

(D) processing the outputs to determine whether predetermined test criteria are met;
and

(E) depending on a determination in step (D), generating a new set of test patterns based on the set of selected test patterns provided in step (A) using a genetic algorithm; and

using testing the integrated circuit with the new set of test patterns to test the
integrated circuit and outputting a result of the testing step.

Claim 38 (currently amended). A computer-readable medium having computer-executable instructions that, when executed, cause a computer to perform a method which comprises the steps of:

adapting a neural network to approximate a behavior of the integrated circuit , by:

- (a) applying a set of test patterns to the integrated circuit;
- (b) applying the set of test patterns to the neural network;
- (c) comparing outputs of the integrated circuit and outputs of the neural network to form a comparison result; and
- (d) adapting parameters of the neural network to approximate the behavior of the integrated circuit on a basis of the comparison result;

subsequently applying further test patterns to the neural network thus adapted;

processing an output of the neural network to determine whether predetermined criteria are met;

selecting those further test patterns that meet the predetermined criteria;

(A) providing a set of test patterns consisting of the selected test patterns;

(B) applying the set of selected test patterns to the integrated circuit using automatic test equipment (ATE) as a measurement system for semiconductors;

(C) determining the outputs of the integrated circuit;

(D) processing the outputs to determine whether predetermined test criteria are met;
and

(E) depending on a determination in step (D), generating a new set of test patterns based on the set of selected test patterns provided in step (A) using a genetic algorithm; and

~~using testing the integrated circuit with~~ the new set of test patterns ~~to test the integrated circuit~~ and outputting a result of the testing step.